

CLAIMS

1. An optical information recording medium, comprising a first information layer, an intermediate layer, and a second information layer, in that order, on a substrate, with which the recording and reproduction of information are performed by causing laser light to be incident from the second information layer side,

wherein both of the information layers have a recording layer composed of a material containing Te, O, and M (where M is one or more elements selected from among Al, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au, and Bi), and

$$M_2 > M_1$$

is satisfied, where M_1 is the compositional ratio of the material M in the first information layer, and M_2 is the compositional ratio of the material M in the second information layer.

2. The optical information recording medium according to Claim 1, wherein the recording layers each contain the material M in an amount of at least 1 atom% and no more than 30 atom%.

3. The optical information recording medium according to Claim 1 or 2, wherein the thickness of the recording layers is at least 1 nm and no more than 50 nm.

4. The optical information recording medium according to Claims 1 to 3, wherein at least one of the first and second information layers has a protective layer on the substrate side of the recording layer and/or the opposite side from the substrate side.

5. The optical information recording medium according to Claim 4, wherein the material of the protective layer is ZnS, at least one oxide selected from among Si-O, Al-O, Ti-O, Ta-O, Zr-O, and Cr-O, at least one nitride selected from among Ge-N, Cr-N, Si-N, Al-N, Nb-N, Mo-N, Ti-N, and Zr-N, at least one carbide selected from among Ge-C, Cr-C, Si-C, Al-C, Ti-C, Zr-C, and Ta-C, at least one fluoride selected from among Si-F, Al-F, Mg-F, Ca-F, and La-F, or a combination of these (such as ZnS-SiO₂).

6. The optical information recording medium according to Claim 4 or 5, wherein the thickness of the protective layer is at least 3 nm and no more than 50 nm.

7. The optical information recording medium according to Claims 1 to 6, wherein at least one of the first and second information layers has a reflective layer on the substrate side of the recording layer.

8. The optical information recording medium according to Claim 7, wherein the reflective layer is composed of a material whose main component is at least one element selected from among Ag, Al, Au, Si, Cu, Ni, Cr, and Ti.

9. The optical information recording medium according to Claim 7 or 8, wherein the thickness of the reflective layer is at least 3 nm and no more than 200 nm.

10. An optical information recording medium, comprising a first information layer, a second information layer, ..., and an n-th information layer (where n is an integer of 3 or greater), in that order, on a substrate, with each of these separated by an intermediate layer, with which the recording and reproduction of information are performed by causing laser light to be incident from the n-th information layer side,

wherein all of the information layers have a recording layer composed of a material containing Te, O, and M (where M is one or more elements selected from among Al, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au, and Bi), and

$$M_n \geq \dots \geq M_2 \geq M_1 \text{ and } M_1 \neq M_n$$

are satisfied, where M_1 is the compositional ratio of the material M in the first information layer, M_2 is the compositional ratio of the material M in the second information layer, ..., and M_n is the compositional ratio of the material M in the n-th information layer.

11. The optical information recording medium according to Claim 10, wherein the recording layers each contain the material M in an amount of at least 1 atom% and no more than 30 atom%.

12. The optical information recording medium according to Claim 10 or 11, wherein the thickness of the recording layers is at least 1 nm and no more than 50 nm.

13. The optical information recording medium according to Claims 10 to 12, wherein at least one of the first to n-th information layers has a protective layer on the substrate side of the recording layer and/or the opposite side from the substrate side, and the protective layer is composed of a material with a refractive index n of at least 1.5.

14. The optical information recording medium according to Claim 10 or 13, wherein at least one of the first to n-th information layers has a reflective layer on the substrate side of the recording layer, and the reflective layer is composed of a material whose refractive index n is no more than 2 and whose extinction coefficient k is at least 2.

15. A method for manufacturing the optical information recording medium according to any of Claims 1 to 14, comprising annealing in which the temperature is held at 60°C or higher for at least 5 minutes after at least the recording layers have been formed.